

## A new Phycodinae species (Lepidoptera, Brachodidae) from China

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**Abstract** A new species of *Nigilgia* Walker, 1863 is described from Mt Nanling, Guangdong Province, China. It differs from all congeners by the violet sheen of the forewings, the form of the metallic wing markings and the structure of the male genitalia.

**Key words** Sesiioidea, Phycodes, *Nigilgia*, flower visiting, Guangdong.

### Introduction

The Brachodidae are a family of predominantly day-flying moths associated with the superfamily Sesiioidea. Two subfamilies are presently recognized, Brachodinae and Phycodinae. Brachodinae represent the larger of the two subfamilies. Their larvae feed on monocotyledonous plant families and are distributed with the grass and sedge lands throughout Australia, South Africa and the Palaearctic region. They also occur in the tropical forests of the Indo-Australian region and South America where their larvae feed endophagously in palms and Bromeliaceae (Heppner, 1981; Kallies, 1998a, 2004). Phycodinae are a distinct subfamily including small to medium sized moths with often striking metallic wing markings. Except for a small genus which occurs in South America and some species which penetrate the southern parts of the Palaearctic, their distribution is limited to the Old World tropics. A third group of brachodid moths, Pseudocossinae, is found only on Madagascar. This group has been proposed to form a distinct subfamily; however, these moths show strong similarities to typical Brachodinae (Heppner 1984; Minet, 1991). The Brachodidae of the Oriental region were the subject of a recent review which listed 41 species for the region (Kallies, 2004).

Owing to their fast and erratic flight and the lack of methods to attract them Brachodidae are typically not well-represented in collections. Adults can be found flying in bright sunshine around their host plants or resting nearby. The scanty knowledge of the bionomics of most species, however, typically prevents targeted sampling. Occasionally specimens get attracted to light, presumably when resting near the trapping site, although predominantly nocturnal species are known to occur in Central Asia and in Australia (Kallies, 1998b and unpublished). Many species of both subfamilies have a well developed proboscis which suggests feeding on flowers or juices. Very few observations confirming this behavior have been published.

Recently, a series was found of an unusual Phycodinae species on blossom of *Patrinia* (Valerianaceae) in the Nanling Mts in the province of Guangdong, China. The moths were actively sucking on the flowers in the afternoon. Examination of these specimens revealed that they belong to an undescribed species of the genus *Nigilgia* Walker 1863. The range of this genus covers northern Australia, Papua New Guinea, most of tropical Asia, the Arabian

Peninsula and the Afrotropical region. In the Oriental region and adjacent areas this genus at present includes eight named and several undescribed species (Kallies, 2004). Most of these species share a similar external appearance but can be distinguished according to details of the forewing markings and genitalia morphology. The present species from Nanling, however, differs strikingly from all its congeners by the strong violet sheen of the forewings and the reduced metallic markings.

Acronyms. SCAU: South China Agricultural University, Guangzhou, China. NSMT: National Science Museum, Tokyo. CAK: Collection of Axel Kallies.

***Nigilgia violacea* Kallies et Arita, sp. nov.** (Figs 1–4)

Holotype. ♀, China, Guangdong, Shaoguan, Nanling, 800 m, 8. IX. 2005, on flowers of *Patrinia* sp., (SCAU). Paratypes. 6 ♂ 4 ♀, same dates as holotype (SCAU, NSMT, CAK).

Description. Male (Fig. 1). Alar expanse 14.5 mm, body length 6 mm. Head: antenna simple, black, entirely covered with short cilia; frons anthracite-shining, smooth; vertex rough-scaled, black, with strong violet sheen; posterior part of the head covered with smooth, shining scales; pericephalic scales black and narrow; labial palps shining black, basal segment with white scales. Thorax: black; with a brush of black bristle-like scales between neck plate and patagia; patagia smooth dark shining; legs dark grey to black, coxae light grey at the distal end, tibiae with some yellow scales apically, the two basal tarsomeres each with white scales apically. Abdomen: dorsally black; ventral sternites with broad dirty-white posterior bands. Forewing: black with a strong violet lustre; with metallic golden scales at the base; with a dull-black transverse fascia bordered by short transverse streaks of golden scales at about 1/3 of the costa, two similar streaks and a short horizontal golden line between them at 2/3; subbasal, central, and subapical parts of the forewing covered with black white-tipped scales; fringe and underside dark brown to black. Hindwing: uniformly dark brown to black; fringe somewhat lighter in anal area.

Male Genitalia (Fig. 3). Uncus pointed, ventral margins with a series of long and strong setae (Fig. 3a); juxta simple (Fig. 3b); saccus wide at the base, tapered towards the apex (Fig. 3c); valva with a short process at the ventral margin, clothed with narrow scale-like setae; sacculus with a long and pointed dorsal extension; inner surface of valva with fine hair-like setae (Fig. 3d); aedeagus simple and straight (Fig. 3e).

Female (Fig. 2). Alar expanse 15 mm, body length 7 mm. Similar to male. Antenna not ciliate but covered with black scales; tip of the abdomen with some yellow to grey scales.

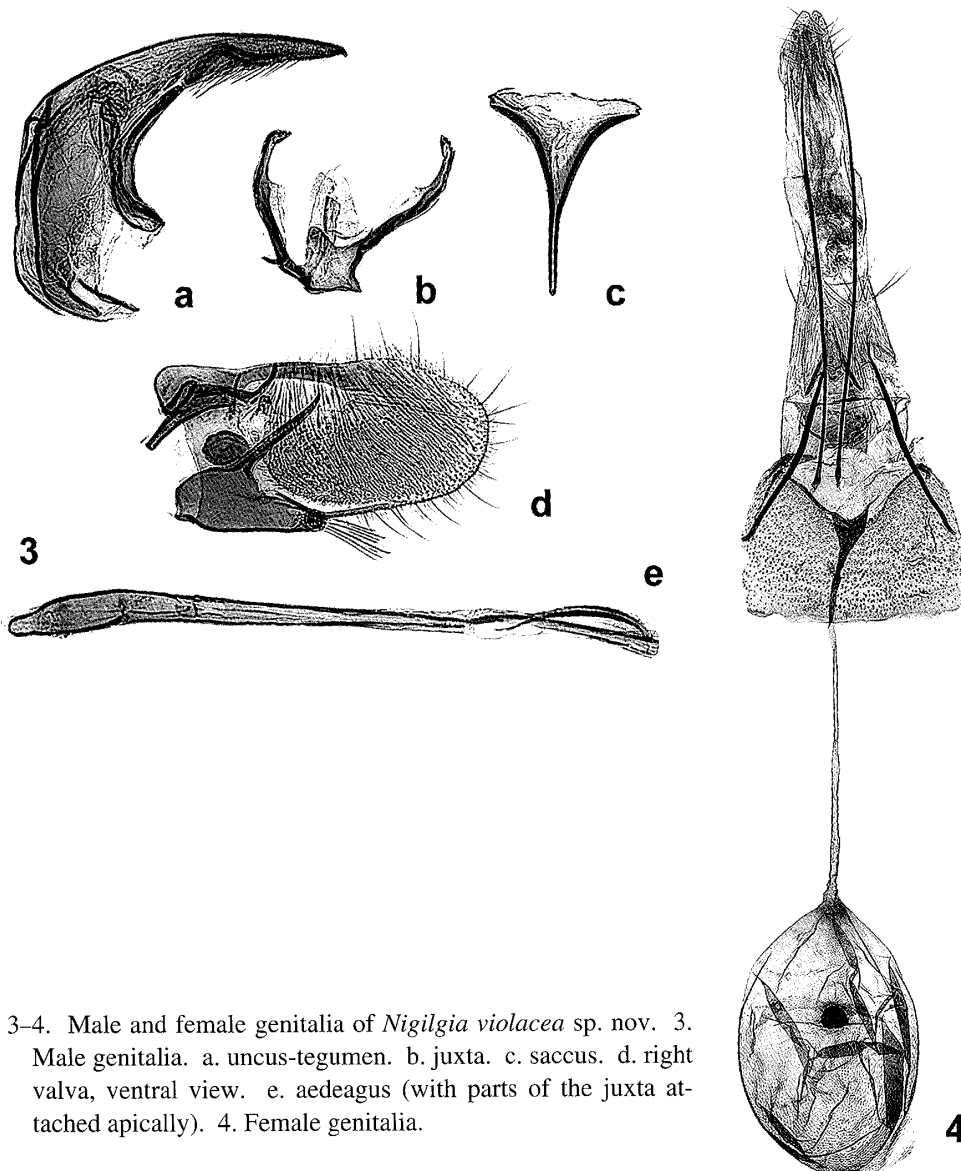
Female Genitalia (Fig. 4). Apophyses posteriores long, about twice as long as the anterior pair; lamella postvaginalis developed, arrow head shaped; ostium funnel shaped, in a wide insertion of the posterior margin of the 7th sternite; ductus bursae long, narrow and straight; corpus bursae ovoid, with a strongly sclerotized corpuscular signum.

Variability. Alar expanses range from 13.0 to 15.0 mm in males and 14.5 to 17.0 mm in females. The short horizontal golden line in the forewing is sometimes connected to the costa, especially in females. In some specimens the outer costal golden streaks are marked by cream scales with only individual golden scales.

Diagnosis. This new species is unusual amongst its congeners and shows some similarities to *Paranigilgia* Kallies, 1998. Characters such as the position of R5 in the forewing (towards the termen), the presence of metallic scales on the forewing and the absence of a pronounced ventral projection (sacculus) of the valva are, however, clearly indicative for the placement of this new species in *Nigilgia*. The retention of other, presumably plesiomor-



Figs 1–2. *Nigilia violacea* sp. nov. 1. Male, paratype, alar expanse 14.5 mm. 2. Female, paratype, alar expanse 15.0 mm.



Figs 3–4. Male and female genitalia of *Nigilia violacea* sp. nov. 3. Male genitalia. a. uncus-tegumen. b. juxta. c. saccus. d. right valva, ventral view. e. aedeagus (with parts of the juxta attached apically). 4. Female genitalia.

phic character states, including the simple saccus, the presence of a ventral sclerotization on the female 8th segment (lamella postvaginalis) as well as the comparably short ovipositor of the female suggests a basal position in the genus.

Remarks Except from earlier papers by Meyrick (1913, 1914) who published *Nigilgia adjectella* Walker 1863 erroneously from various parts of Asia including China, *Nigilgia violacea* sp. nov. is the first species of this genus reported from Chinese mainland. *Phycodes minor* Moore, 1881 and *Phycodes radiata* (Ochsenheimer, 1808) have been the only two species of Phycodinae known to occur in China outside Taiwan. The presence of additional species of this subfamily, however, seems likely as another two species have been found on Taiwan, *Nigilgia limata* Diakonoff & Arita, 1979 and *Paranigilgia bushi* (Arita, 1980).

The Brachodinae subfamily is represented in mainland China by only a small number of species of the genus *Brachodes*. *Brachodes pumila* (Ochsenheimer, 1808), *B. straminella* (Rebel, 1916), *B. staudingeri* Kallies, 1998, *B. neglectus* Kallies, 1998 and *B. fallax* (Staudinger, 1900) occur in the north-western part of China while *Brachodes flagellatus* Kallies, 2003 has been described from the high mountains of Tibet (Kallies, 1998b, 2001). One species, *Miscera sauteri* Kallies, 2004, was described from Taiwan.

Little is known about the host plants of *Nigilgia*. Several species are known to feed on the leaves of *Ficus* species (Moraceae) (Viette, 1955, Diakonoff & Arita, 1979, Diakonoff, 1986) a plant genus that is also utilized by species of the genus *Phycodes* (Fletcher, 1914, 1920, Arita, 1989). This makes it unlikely that *Patrinia* is the larval food plant of the species described here.

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## Literature

- Arita, Y., 1989. Records of two species of *Phycodes* Guenée (Lepidoptera: Brachodidae) from Thailand. *Microlepid. Thai.* **2**: 15–21.
- Diakonoff, A. N., 1986. Glyphipterigidae auctorum sensu lato (Glyphipterigidae sensu Meyrick, 1913). In Amsel, H. G. et al. (Eds), *Microlepidoptera Palaearctica* **7**. 436 pp., 175 pls. Braun, Karlsruhe.
- Diakonoff, A. N. & Y. Arita, 1979. Three new species of the so-called Glyphipterigidae auctorum from Japan (Lepidoptera). *Zool. Meded. Leiden* **54**: 87–100.
- Fletcher, T. B., 1914. *Some South Indian Insects and other Animals of Importance considered especially from an economic Point of View*. 565 pp. Ministry of Agriculture, Madras.
- , 1920. Life-histories of Indian Insects. Microlepidoptera. V. Heliozelidae, Heliodinidae, Glyphipterigidae, Blastobasidae and Hyponomeutidae. *Mem. Dept. agric. India* (ent. Ser.) **6** (5): 117–167, pls 22–45.
- Heppner, J. B., 1981. Brachodidae. In Heppner, J. B. & W. D. Duckworth, 1981. Classification of the Superfamily Sesiioidea (Lepidoptera: Ditrysia). *Smithson. Contr. Zool.* **314**: 1–144.
- , 1984. Pseudocossinae: a new subfamily of Cossidae (Lepidoptera). *Ent. News* **95**: 99–100.
- Kallies, A., 1998a. A Contribution to the knowledge of the Oriental and Australian Brachodidae (Lepidoptera, Sesiioidea). *Tinea* **15**: 312–337.
- , 1998b. First contribution to the knowledge of the Palaearctic Brachodidae: revision of *Brachodes fallax* with descriptions of new species from Central Asia. *Nota lepid.* **21**: 170–193 (in German).
- , 2001. Revision of the *Brachodes pumila* (Ochsenheimer, 1808) species group (Sesiioidea: Brachodidae). *Nota lepid.* **24**: 7–19.
- , 2004. The Brachodidae of the Oriental region and adjacent territories (Lepidoptera: Sesiioidea). *Tijdschr. Ent.* **147**: 1–19.
- Minet, J., 1991. Tentative reconstruction of the ditrysian phylogeny (Lepidoptera: Glossata). *Entomologica scand.* **22**: 69–95.
- Meyrick, E., 1913. Glyphipterigidae. *Exotic Microlepidoptera* **1**: 67–70, 98–104.
- , 1914. Glyphipterigidae. *Exotic Microlepidoptera* **1**: 283–284.
- Viette, P. E. L., 1955. Nouveaux Tineoidea (s. l.) de Madagascar (Lep.). *Ann. Soc. ent. Fr.* **123**: 75–114.

## 摘 要

中国から Phycodinae 亜科 (鱗翅目, ヒロハマキモドキガ科) の新種 (Axel Kallies ・ 有田 豊 ・ 王 敏)

中国南部からヒロハマキモドキガ科 Phycodinae 亜科の *Nigilgia* 属のヒロハマキモドキを新種記載した. この Phycodinae 亜科の *Nigilgia* 属の種は, 中国から初めての記録である.

*Nigilgia violacea* Kallies et Arita, sp. nov. (Figs 1-4)

中国広州南嶺でオトコエシに非常に良く似た *Patrinia* 属の花に日中飛来していた. 本種は, 前翅が紫色に輝くことと鉛色に輝く斑紋などから, この属の他種と容易に区別される. 中国広州南嶺でオトコエシに非常に良く似た *Patrinia* 属の花に日中飛来していたことが観察されている.

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